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they belong to the same linkage group, in both species. Since this happens to be the sex-linked group it means in reality that three corresponding factors—the sex factor, the yellow factor and the forked factor—are linked in both species. Whether the same degree of linkage obtains in each has not been determined.

It is, of course, too early to generalize from this one case, but certainly the evidence strongly suggests that there is a genetic continuity of factorial associations in these flies. And if the factors are located in the chromosomes it is equally suggestive of a genetic continuity of the chromosomes.

So far as I know this is the first clear case of the kind on record, and since the work promises further evidence on the same point a word may be said regarding the chromosomes of the species concerned. As is well known *Drosophila ampelophila* has four pairs of chromosomes—two of large euchromosomes, one of shorter sex-chromosomes and one of very small “m-chromosomes.” In contrast to this the species I am breeding has six chromosome pairs, of which only two resemble those in *ampelophila*. The latter are the sex-chromosomes and the “m-chromosomes.” The other four pairs replace the two euchromosome pairs of *ampelophila* and are individually about half their size.²

Upon the chromosome hypothesis characters in this new species should fall into six linkage groups instead of four. And what is of much greater interest, if present indications are reliable, it may eventually be possible to compare these groups (and hence the chromosomes?) individually with those in *ampelophila* by means of corresponding characters. The first step in this comparison may be represented by the sex-linked characters yellow and forked mentioned above.

A more detailed report of these results will be presented as soon as certain experiments now under way are completed.

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² See Metz, C. W., “Chromosome Studies in the *Diptera*,” I., *Jour. Exp. Zool.*, 1914, p. 50.

BACTERIAL BLIGHTS OF BARLEY AND CERTAIN OTHER CEREALS

At the Columbus meeting of the American Phytopathological Society the writers reported on a bacterial disease of barley. This was described as a widely occurring disease attacking leaves, leaf sheaths and glumes, early characterized by water-soaked lesions with bacterial exudate, and later by the persistent transparency following the death of the parts invaded. The abstract of this paper appeared in *Phytopathology* (Vol. 6, p. 98). Laboratory and field studies have now been completed which confirm all of the preliminary statements and furnish the data for the publication of the causal organism as a new species. It is a monotrichous rod with a single polar flagellum, hence referable to Migula's genus *Pseudomonas*. Field and laboratory studies have combined to show that it is seed borne, and that in this way it is readily disseminated. This fact accounts for its very general distribution, it having already been collected from eight states. Not only has the development of the disease been traced in the field where infected seed was used, but, in addition, the organism has been secured in pure culture from seed collected two years previously, and successful inoculations with this have proved its continued virulence.

Diseases very similar to the one on barley have been found and studied on wheat, spelt and rye. These have all been proved to be of bacterial origin. From each of these hosts the causal organism has been isolated, and its pathogenicity fully determined. The organisms from these three sources are apparently all one species and they are very similar to the barley blight organism.

This similarity holds for the appearance and development of the disease lesions, and for the morphological and cultural characters of the organisms. All like the barley organism are monotrichous and yellow in culture. The chief difference noted is in the behavior in cross inoculations. The barley blight organism when inoculated on wheat, rye, spelt, oats and barley, infects barley only. The wheat,

rye and spelt organisms all behave alike as to pathogenicity when inoculated on wheat, rye, spelt, barley and oats in that they each infect all these grains except oats. A blade blight of oats quite different in type from the blights of the other grains noted above has also been found in Wisconsin and its bacterial cause determined. This disease apparently corresponds in appearance with the bacterial blade blight of oats described by Manns.¹ From it a monotrichous white organism has been isolated which in pure culture infects oats readily but apparently is not pathogenic on the other cereals listed above.

The detailed account of the studies upon barley blight together with the technical description of that organism as a new species has already been sent to press. The results of the comparative studies on these other bacterial grain blights will be given in a subsequent publication.

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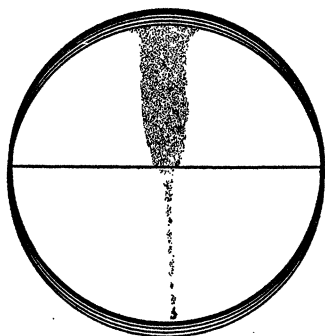


FIG. 1. *Aspergillus* growing on potato agar. The lower half contains oil of nutmeg (1:200) which inhibits growth of mold.

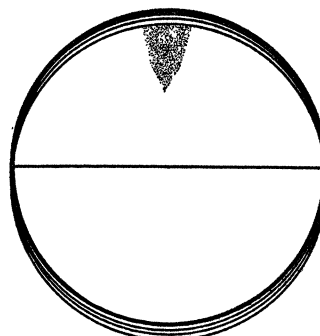


FIG. 2. *Penicillium* on potato agar. Marked inhibition due to eugenol (1:1,000) in lower half of dish.

ANOTHER USE OF THE DOUBLE-PLATE METHOD¹

IN a study of the antagonism exhibited by

¹ Manns, T. F., "The Blade Blight of Oats; a Bacterial Disease," *Ohio Agr. Exp. Sta. Bull.*, 210, pp. 91-167, 1909.

¹ Read at the meeting of the Society of American Bacteriologists, Urbana, Ill., December 28-

certain bacteria for *B. typhosus*, one of us (W. D. F.) used and described a method called by us the "double-plate method."² This method enabled us to see and photograph the effect which certain bacteria had in limiting or preventing the growth of *B. typhosus*. The method consisted of dividing a petri dish in halves by means of a small rod or tube and flooding one half of this double-plate with sterile agar and the other with agar containing the antibiotic. Over the surfaces of both halves the other antibiotic was streaked. The resulting growth of the streaks readily showed the effect of the antagonism.

Some eight years later, Churchman³ describes an identical procedure for demonstrating the selective action of gentian violet. He makes no mention of our method but substitutes a metal strip for the glass rod and the name "divided plate" for double-plate. He was evidently not aware of our previous description.

Recently we have used this method for deter-

30, 1915. Publication authorized by the Director of the Wisconsin Experiment Station.

² Frost, W. D., "The Antagonism Exhibited by Certain Saprophytic Bacteria Against the *Bacillus typhosus* Gaffky," *Jour. Inf. Dis.*, November 5, 1904, pp. 599-641.

³ Churchman, "The Selective Bactericidal Action of Gentian Violet," *Jour. Exp. Med.*, Vol. 16, 1912, pp. 221-247.